



## DISPOSABLE DIAPER

### BACKGROUND OF THE INVENTION

This invention relates to a disposable diaper for absorption and containment  
5 of body wastes and the like.

Japanese Patent Application A No. 1996-196565 discloses a disposable diaper comprising a liquid-pervious topsheet, a liquid-impervious backsheet and a liquid-absorbent core interposed between these sheets. The core consists of an upper layer core and a lower layer core. The upper layer core consists of, in turn, a front  
10 core extending from a front waist region toward a crotch region and a rear core extending from a rear waist region toward the crotch region. In this diaper, a rear end of the front core and a front end of the rear core are spaced from each other in a longitudinal direction of the diaper by a given dimension, and the topsheet covering the upper surface of the upper core is folded back along the rear end of the front core  
15 and the front end of the rear core toward the lower layer core and tucked between the upper core and lower layer core.

In this diaper of well known art, a pocket is formed between the front core and the lower layer core so as to open from the front waist region toward the crotch region and another pocket is formed between the rear core and the lower layer core so as to  
20 open from the rear waist region toward the crotch region. In this way, these pockets can receive feces.

However, the diaper disclosed in the above-cited Application has no arrangement for positively spacing the rear end of the front core and front end of the rear core upward from the lower layer core, so the rear end of the front core as well as the front end of the rear core are apt to come in contact with the lower core.

5 Correspondingly, it is difficult for the pockets to be sufficiently opened. With this diaper of well known art, the quantity of feces ~~which can~~ cannot be easily received within these pockets ~~even if the pockets are slightly opened~~. The excessive quantity of feces may cling to a wearer's skin.

#### SUMMARY OF THE INVENTION

10 It is an object of this invention to provide a disposable diaper improved so as to ensure that pockets are sufficiently opened and thereby prevent any quantity of feces from clinging to wearer's skin.

According to this invention, there is provided a disposable diaper comprising a basic absorbent batt structure and at least one supplementary absorbent batt  
15 structure. The basic absorbent batt structure has a liquid-pervious body ~~faeing~~ faceable surface and a liquid-impervious garment ~~faeing~~ faceable surface, and a front waist region, a rear waist region and a crotch region. The supplementary absorbent batt structure has a liquid-pervious body facing surface and an opposite lower surface, and a proximal end portion lying the front waist region and a distal end portion lying  
20 the crotch region, and being placed upon the body facing surface of the basic absorbent batt structure. The proximal end portion lies the front waist region while the distal

- 3 -

end portion lies the crotch region.

An elastic member under an extension in a transverse direction extends in the transverse direction across the diaper along a zone of the distal end portion of the supplementary absorbent batt structure rather adjacent its proximal end portion and  
5 has its transversely opposite end regions substantially connected to the side edge regions of the basic and supplementary ~~[[absorent]]~~ absorbent batt structures. Contraction of the elastic member causes the side edge regions of the supplementary absorbent batt structure to be pulled nearer to a longitudinal center line of the diaper so that the distal end portion of the supplementary absorbent batt structure curves so  
10 as to delineate a circular arc which is convex upward with respect to the body facing surface of the basic absorbent batt structure and consequently a pocket opening from the front waist region toward the crotch region is formed between the basic and supplementary absorbent batt structure.

#### BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a partially cutaway perspective view showing ~~[[the]]~~ a diaper as viewed from ~~[[the]]~~ a side of the topsheet;

Fig. 2 is a cross-sectional view taken along ~~[[a]]~~ the line ~~[[A - A]]~~ II - II in Fig. 1;

Fig. 3 is a cross-sectional sectional view taken along a line ~~[[B - B]]~~ III - III in

20 Fig. 1;

Fig. 4 is a perspective view and a partially cross-sectional view showing the

- 4 -

diaper of Fig. 1 as put on the wearer's body with [[the]] front and rear waist regions connected to each other;

Fig. 5 is a partially cutaway perspective view showing another embodiment of the diaper;

5        Fig. 6 is a cross-sectional view taken along [[a]] the line [[C - C]] VI - VI in Fig. 5;

Fig. 7 is a cross-sectional view taken along [[a]] the line [[D - D]] VII - VII in Fig. 5;

10       Fig. 8 is a perspective view and a partially sectional view showing the diaper of Fig. 5 partially in a sectional view as put on the wearer's body with the front and rear waist regions connected to each other;

Fig. 9 is a partially cutaway perspective view showing still another embodiment of the diaper; and

15       Fig. 10 is a cross-sectional view taken along [[a]] the line [[E - E]] X - X in Fig. 9.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Details of a disposable diaper according to this invention will be more fully understood from the description on an open-type diaper adopted as an exemplary case given hereunder in reference to the accompanying drawings.

20       Fig. 1 is a partially cutaway perspective view showing a diaper 1A as viewed from the side of a topsheet 2 and partially broken away, Fig. 2 is a cross-sectional view

- 5 -

taken along ~~[[a]] the~~ line ~~[[A - A]]~~ II - II in Fig. 1, Fig. 3 is a cross-sectional view taken along ~~[[a]] the~~ line ~~[[B - B]]~~ III - III in Fig. 1 and Fig. 4 is a perspective view and a partially cross-sectional view showing the diaper 1A of Fig. 1 as put on a wearer's body with front and rear waist regions 20, 22 connected to each other. In Fig. 1, a  
 5 transverse direction is indicated by an arrow X and a longitudinal direction is indicated by an arrow Y.

The diaper 1A comprises a liquid-pervious topsheet 2, a liquid-impervious backsheet 3, a liquid-absorbent first core 4 ~~[[disposed]]~~ disposed between these two sheets 2, 3, a liquid-absorbent second core 6 wrapped by a liquid-pervious covering  
 10 sheet 5, and substantially liquid-impervious barrier cuffs 7. The topsheet 2, the backsheet 3 and the first core 4 constitute a basic absorbent batt structure 4A and the covering sheet 5 and the second core 6 constitute a supplementary batt structure 6A. The diaper 1A is composed, in the longitudinal direction, of a front waist region 20, a rear waist region 22 and a crotch region 21 extending between the front and rear waist  
 15 regions 20, 22.

The batt structure 4A has a body ~~faeing~~ faceable surface 4a defined by the topsheet 2 ~~4c above an upper surface of the core 4~~ and a garment ~~faeing~~ faceable surface ~~4d beneath a lower surface of the core 4~~, 4b defined by the backsheet 3 and longitudinally opposite ~~ends 4a~~ end portions 4c transversely extending in the front and  
 20 rear waist regions 20, 22 and transversely opposite side edge portions ~~[[4b]]~~ 4d longitudinally extending between these two ~~ends 4a~~ end portions 4c. A pair of end

- 6 -

flaps 8 transversely extends ~~along~~ between the respective ~~ends 4a~~ end portions 4c and the associated end portions of the core (4). A pair of side flaps 9 longitudinally extends ~~along~~ between the side edge ~~portion 4b~~ portions 4d and the associated side edge portion of the core (4). In the crotch region 21, the side flaps 9 curve inwardly in

5 the transverse direction of the diaper 1A so as to delineate circular arcs, respectively.

The batt structure 6A has a body ~~facing~~ faceable surface ~~above 6a~~ defined by an upper ~~surface 6e~~ portion of the ~~second core 6~~ covering sheet 5 and an opposed lower surface ~~6d beneath 6b~~ defined by a lower portion surface of the covering sheet 5 ~~second core 6~~ and is placed upon the body facing surface ~~[[4c]]~~ 4a of the batt structure 4A and

10 extends from the front waist region 20 toward the crotch region 21. The batt structure 6A has a proximal end portion ~~[[6a1]]~~ 6c placed upon the ~~end 4a~~ side edge portion 4d of the batt structure 4A in the front waist region 20, a distal end portion ~~[[6a2]]~~ 6d lying in the crotch region 21 and transversely opposite side edge ~~portion 6b~~ portions 6e placed upon the respective side edges ~~4b~~ edge portions 4d of the batt

15 structure 4A and longitudinally extending between these two end portions ~~6a1, 6a2~~ 6c, 6d.

~~In the diaper 1A, [[the]]~~ The one end ~~[[4a]]~~ 4c of the batt structure 4A and the proximal end portion ~~[[6a1]]~~ 6c of the batt structure 6A are joined to each other by means of the topsheet 2 and the ~~liquid-pervious~~ covering sheet 5. The transversely

20 opposite side edge portions ~~[[4b, 6b]]~~ 4d, 6e of ~~these~~ the batt structure 4A, 6A, respectively, are joined together also by means of the topsheet 2 and the

- 7 -

~~liquid-pervious~~ covering sheet 5.

In the ~~diaper 1A, a~~ A first elastic member 10 under an extension in the transverse direction extends across the diaper 1A along a zone of the distal end portion ~~[[6a2]]~~ 6d of the batt structure 6A rather adjacent its proximal end portion ~~6c~~ 6a.  
 5 This while this first elastic member 10 lies between the topsheet 2 and the upper portion of covering ~~the liquid-pervious~~ sheet 5 and has its transversely opposite end portions 10a lying on the side edge portions ~~[[4b, 6b]]~~ 4d, 6e of the batt structure 4A, 6A, respectively, are joined to the topsheet 2 and the ~~liquid-pervious~~ covering sheet 5 by means of hot melt adhesive (not shown). Substantially, the transversely opposite  
 10 end portions 10a of the first elastic member 10 are connected to the side edge portions ~~[[4b]]~~ 4d of the batt structure 4A and to the side edge portions ~~[[6b]]~~ 6e of the batt structure 6A.

~~In the diaper 1A, contraction~~ Contraction of the first elastic member 10 causes the side edge portions ~~[[4b]]~~ 4d of the batt structure 4A and the side edge portions  
 15 ~~[[6b]]~~ 6e of the batt structure 6A to be pulled nearer to a longitudinal center line Z of the diaper 1A. Consequently, the zone of the batt structure 4A underlying the distal end portion ~~[[6a2]]~~ 6d of the batt structure 6A curves so as to delineate a circular arc which is convex downward with respect to the lower surface ~~[[6d]]~~ 6b of the batt structure 6A while the distal end portions ~~[[6a2]]~~ 6d of the batt structure 6A curves so  
 20 as to delineate a circular arc which is convex upward with respect to the body ~~faeing~~ faceable surface ~~[[4c]]~~ 4a of the batt structure 4A. Between the batt structure 4A, 6A,

- 8 -

a pocket P1 with an opening from the front waist region 20 toward the crotch region 21 is formed.

Each of the cores 4, 6 comprises a mixture of fluff pulp and super-absorbent polymer particles or a mixture of fluff pulp, super-absorbent polymer particles and thermoplastic synthetic resin ~~fiber~~ fibers compressed to a desired thickness. Preferably, the cores 4, 6 are entirely covered with a tissue paper in order to prevent the polymer particles from leaking out and/or to prevent the cores 4, 6 from being deformed. The polymer particles may be selected from ~~[[a]]~~ the group consisting of starch, cellulose and synthetic-polymer particles.

The barrier cuffs 7 lie on the side flaps 9 and extend in the longitudinal direction. The cuffs 7 respectively have proximal edge portions 7a extending in the longitudinal direction immediately outside the transversely opposite side edge portions ~~[[4b]]~~ 4d of the batt structure 4A, distal edge portions 7b extending in parallel to the proximal edge portions 7a and normally biased to rise ~~[[on]]~~ up above the body ~~fac~~ing faceable surface ~~[[4c]]~~ 4a of the batt structure 4A and longitudinally opposite fixed end portions 7c lying in the front and rear waist regions 20, 22 and collapsed inwardly in the transverse direction of the diaper 1A. The cuffs 7 respectively have the proximal edge portions 7a joined to the side flaps 9 and the fixed end portions 7c joined to the end flaps 8.

The cuffs 7 further include lateral ~~regions~~ portions 7d extending transversely outward from the respective proximal edge portions 7a. The distal edge portions 7b



- 9 -

are provided with elastic members 11 extending in the longitudinal direction and bonded under extension to the respective distal edge portions 7b. The elastic members 11 are covered with parts of the respective distal edge portions 7b.

The diaper 1A curves in the longitudinal direction with the topsheet 2 inside  
 5 and contraction of the elastic members 11 causes the distal edge portions 7b of the cuffs 7 to rise up above ~~[[on]]~~ the body ~~faeing~~ faceable surface ~~[[4c]]~~ 4a of the batt structure 4A. In the front waist region 20, the distal edge portions 7b of the cuffs 7 rise ~~[[on]]~~ up above the body ~~faeing~~ faceable surface ~~[[6c]]~~ 6a of the batt structure 6A.

The end flaps 8 are provided with belt-like elastic members 12 extending in  
 10 the transverse direction and bonded under extension to the respective end flaps 8 so as to be operatively associated with a waist-hole. In the crotch region 21, the side flaps 9 are respectively provided with a plurality of elastic members 13 extending in the longitudinal direction and bonded under extension to the respective side flaps 9 so as to be operatively associated with leg-holes.

15 In the rear waist region 22, proximal end ~~regions~~ portions of tape fasteners 14 are joined to the respective side flaps 9 so that these tape fasteners 14 may extend transversely inward. The tape fasteners 14 are coated on their ~~[[free]]~~ distal end ~~regions~~ portions with adhesive (not shown). In the front waist region 20, the backsheet 3 is provided on its outer surface with a rectangular target tape strip 15  
 20 formed of a plastic film and serving as a landing zone for the tape fasteners 14.

In the end flaps 8, longitudinally opposite end ~~regions~~ portions 2a of the

- 10 -

topsheet 2 as well as longitudinally opposite end ~~regions~~ portions 3a of the backsheet 3 extend longitudinally outward beyond the longitudinally opposite ends ~~[[4a]]~~ of the ~~batt structure 4A~~ core 4 and are overlaid and joined to each other as will be best seen in Fig. 2. Longitudinal end regions 5a of the ~~liquid-pervious~~ covering sheet 5 forming  
5 the ~~fixed end 6a~~, proximal end portion 6c of the batt structure 6A are overlaid and joined to each other as well as to the associated end ~~regions~~ portions 2a of the topsheet 2. The longitudinally opposite fixed end ~~regions~~ portions 7c of the cuffs 7 are joined to the respective end ~~regions~~ portions 5a of the ~~liquid-pervious~~ covering sheet 5. The elastic members 12 operatively associated with the waist-hole are interposed between  
10 the end ~~regions~~ portions 2a of the topsheet 2 and the end ~~regions~~ portions 3a of the backsheet 3, respectively, and joined to these end ~~regions~~ portions 2a, 3a.

In the side flaps 9, transversely opposite side edge ~~regions~~ portions 2b of the topsheet 2 forming parts of the side edge portions ~~[[4b]]~~ 4d of the batt structure 4A and transversely opposite side edge ~~regions~~ portions 3b of the backsheet 3 as well as the  
15 lateral ~~regions~~ portions 7d of the cuffs 7 extend transversely outward beyond the side edge ~~regions~~ portions 2b of the topsheet 2, as will be best seen in Fig. 3. The side edge ~~regions~~ portions 2b and the side edge ~~regions~~ portions 3b are overlaid and joined to each other. The side edge ~~regions~~ portions 3b and the lateral ~~regions~~ portions 7d are overlaid and joined to each other.

20 Transversely opposite side edge ~~regions~~ portions 5b of the ~~liquid-pervious~~ covering sheet 5 forming the side edge ~~regions 6b~~ portions 6e of the batt structure 6A

- 11 -

are overlaid and joined to each other, interposed between the side edge ~~regions~~ portions 2b of the topsheet 2 and the proximal edge portions 7a of the cuffs 7, and joined to the side edge ~~regions~~ portions 2b and the proximal edge portions 7a ~~[[of]]~~ on the backsheet 3, 7a. The elastic members 13 operatively associated with the leg-holes  
 5 are interposed between the side edge ~~regions~~ portions 3b of the backsheet 3 and the lateral ~~regions~~ portions 7d of the cuffs 7 and joined to these ~~regions~~ portions 3b, 7d.

To wear the diaper 1A, the side flaps 9 in the rear waist region 22 are placed upon the outer side of the side flaps 9 in the front waist region 20 and the ~~free~~ distal end ~~regions~~ portions of the respective tape fasteners 14 are anchored on the target  
 10 tape strip 15 by means of adhesive so as to connect the front and rear waist regions 20, 22 to each other. With the diaper 1A having the front and rear waist regions 20, 22 connected to each other in this manner, a waist-hole 16 and a pair of leg-holes 17 are defined, as shown in Fig. 4.

With the diaper 1A put on a wearer's body, the batt structure 4A is normally in  
 15 a state curving downward with respect to the lower surface ~~[[6d]]~~ 6b of the batt structure 6A while the distal edge portion ~~[[6a2]]~~ 6d of the batt structure 6A is normally in a state curving upward with respect to the body facing surface ~~[[4c]]~~ 4a of the batt structure ~~[[4]]~~ 4A. In this way, the pocket P1 is sufficiently opened to ensure a desired high level of capacity of this pocket P1 for feces.

20 Even when a large quantity of loose passage or watery feces is discharged on the diaper 1A in the crotch region 21 and spreads on the topsheet 2 toward the front

- 12 -

waist region 20, most of such feces can be received by the pocket P1 and it is not apprehended that such feces might migrate onto the batt structure 6A. This diaper 1A therefore can reliably prevent, in the front waist region 20, any quantity of feces from clinging to a wearer's skin. After such feces have been received in the pocket P1,  
 5 a water-content thereof is absorbed and retained by the batt structures 4A, 6A and a solid-content thereof is retained in the pocket P1.

~~In the diaper 1A, preferably~~ Preferably an absorbing capacity for bodily discharges per unit area of the batt structure 6A is greater than that of the batt structure 4A. Of bodily discharges, urine is discharged onto the batt structure 6A  
 10 and then absorbed thereby. The batt structure 6A has the absorbing capacity for bodily discharges higher than that of the batt structure 4A so that most of urine can be absorbed and retained in the batt structure 6A. Therefore it is not apprehended that any significant quantity of urine once absorbed by the batt structure 6A might flow into the pocket P1 and such urine might be mixed with feces within the pocket P1.

~~In this diaper 1A, the~~ The distal edge portions 7b of the respective cuffs 7 are elastically biased to rise up and to form barriers against bodily discharges. In this way, the diaper 1A ensures to prevent bodily discharges from leaking sideways beyond the side flaps 9.

Fig. 5 is a partially cutaway perspective view showing another embodiment  
 20 1B of the diaper, Fig. 6 is a cross-sectional view taken along ~~the~~ the line ~~[[C - C]]~~ VI · VI in Fig. 5, Fig. 7 is a cross-sectional view taken along ~~the~~ the line ~~[[D - D]]~~ VII · VII

- 13 -

in Fig. 5 and Fig. 8 is a perspective view and a partially cross-sectional view showing the diaper 1B of Fig. 5 as put on a wearer's body with the front and rear waist regions 20, 22 connected to each other. In Fig. 5, a transverse direction is indicated by an arrow X and a longitudinal direction is indicated by an arrow Y. The diaper 1B shown in Fig. 5 is distinguished from the diaper 1A shown in Fig. 1 in that the diaper 1B includes a second supplementary absorbent batt structure 18A.

The batt structure 18A lies on the side of the body ~~fac~~faceable surface ~~[[4c]] 4a~~ of the batt structure 4A and extends from the rear waist region 22 toward the crotch region 21. The batt structure 18A has a proximal end portion ~~[[18a1]] 18c~~ lying in the rear waist region 22 and placed upon the end ~~region 4a~~ portion 4c of the batt structure 4A, a distal end portion ~~[[18a2]] 18d~~ lying in the crotch region 21 and transversely opposite side edge portions ~~[[18b]] 18e~~ placed upon the respective side edge ~~regions 4b~~ portions 4d of the batt structure 4A and extending in the longitudinal direction between the end portions ~~[[18a1, 18a2]] 18c, 18d~~. The batt structure ~~[[18]] 18A~~ has a body facing surface ~~[[18c]] 18a~~ and an opposite lower surface ~~[[18d]] 18b~~ covered with ~~the liquid-pervious sheet 5~~ a covering sheet 23. The ~~liquid-pervious sheet 5~~ covering sheet 23 is folded back along the distal end portion ~~[[18a2]] 18d~~.

~~In the diaper 1B, one~~ One of the longitudinally opposite end ~~region 4a~~ portions 4c of the batt structure 4A and the proximal end portion ~~[[18a1]] 18c~~ of the batt structure 18A are joined together by means of the topsheet 2 and the ~~liquid-pervious sheet 5~~ covering sheet 23. The transversely opposite side edge ~~regions 4b, 18b~~

- 14 -

portions 4d, 18e of the batt structure 4A, 18A are joined together also by means of the topsheet 2 and the ~~liquid-pervious sheet 5~~ covering sheet 23.

~~In the diaper 1B, a~~ A second elastic member 19 under a extension in the transverse direction extends across the diaper 1B along a zone of the distal end  
 5 portion ~~[[18a2]]~~ 18d of the batt structure 18A rather adjacent its proximal end portion 18c ~~18a1~~. ~~This while this~~ second elastic member 19 lies between the topsheet 2 and the ~~liquid-pervious sheet 5~~ an upper portion of covering sheet 23 and its transversely opposite end ~~regions~~ portions 19a lying on the side edge regions ~~4b, 18b~~ 4d, 18e of the batt structure 4A, 18A, respectively, are joined to the topsheet 2 and the  
 10 ~~liquid-pervious sheet 5~~ covering sheet 23 by means of hot melt adhesive (not shown). Substantially, the transversely opposite end ~~regions~~ portions 19a of the second elastic member 19 are connected to the side edge ~~regions 4b~~ portions 4d of the batt structure 4A and to the side edge ~~regions 18b~~ portions 18e of the batt structure 18A.

~~In the diaper 1B, the~~ The side edge regions 4b, 18b portions 4d, 18e of the batt  
 15 structure 4A, 18A are pulled nearer to the longitudinal center line Z. As a result, the zone of the batt structure 4A underlying the distal end portion ~~[[18a2]]~~ 18d of the batt structure 18A curves so as to delineate a circular arc which is convex downward with respect to the lower surface ~~[[18d]]~~ 18b of the batt structure 18A while the distal end portion ~~[[18a2]]~~ 18d of the batt structure 18A curves so as to delineate a circular arc  
 20 which is convex upward with respect to the body ~~facing surface 4e~~ faceable surface 4a of the batt structure 4A. Between the batt structure 4A, 18A, a pocket P2 opening

from the rear waist region 22 toward the crotch region 21 is formed.

A third core 18 of the batt structure 18A comprises a mixture similar to those forming the first and second cores 4, 6 and is compressed to a desired thickness. Preferably, the third core 18 is entirely covered with a tissue paper.

5        ~~In the diaper 1B, a~~ A length L1 by which the batt structure 6A extends from the front waist region 20 to the crotch region 21 is larger than a length L2 by which the batt structure 18A extends from the rear waist region 22 to the crotch region 21. The distal end portions ~~6a<sub>2</sub>, 18a<sub>2</sub>~~ 6d, 18d of the batt structure 6A, 18A, respectively, are spaced from each other in the crotch region 21 so that the body ~~faceable surface 4e~~  
10    faceable surface 4a of the batt structure 4A ~~covered with~~ defined by the topsheet 2 is partially exposed between the distal end portions ~~6a<sub>2</sub>, 18a<sub>2</sub>~~ 6d, 18d. The body ~~faceable surface 4e~~ faceable surface 4a of the batt structure 4A is exposed in a zone of the crotch region 21 put aside to the rear waist region 22.

The end ~~regions 5a~~ portions 23a of the ~~liquid-pervious sheet 5~~ covering sheet  
15    23 forming a part of the proximal end portion ~~[[18a<sub>1</sub>]]~~ 18c of the batt structure 18A are overlaid and joined to each other and joined also to the associated end ~~region~~ portion 2a of the topsheet, as will be best seen in Fig. 6. The fixed end ~~regions~~ portions 7c of the respective cuffs 7 are joined to the respective end ~~regions 5a~~ portions 23a of the ~~liquid-pervious sheet 5~~ covering sheet 23.

20        As will be seen in Fig. 7, the side edge ~~regions 5b~~ portions 23b of the ~~liquid-pervious sheet 5~~ covering sheet 23 forming the respective side edge ~~regions 18b~~

- 16 -

portions 18e of the batt structure 18A are overlaid and joined to each other. These side edge ~~regions 5b~~ portions 23b are disposed between the respective side edge ~~regions~~ portions 2b of the topsheet 2 and the respective ~~fixed side edge regions~~ proximal edge portions 7a of the cuffs 7 and joined to the side edge ~~regions~~ portions 2b and proximal edge portions 7a.

~~In the diaper 1B, the~~ The batt structure 4A curves so as to delineate a circular arc which is convex downward with respect to the lower surface ~~[[18d]]~~ 18b of the batt structure 18A while the distal end portion ~~[[18a2]]~~ 18d of the batt structure 18A curves so as to describe a circular arc which is convex upward with respect to the body ~~faci~~ng surface ~~4e~~ faceable surface 4a of the batt structure 4A. The pocket P2 formed between these batt structure 4A, 18A is largely opened. This diaper 1B allows feces to be received not only by the pocket P1 but also by the pocket P2. In this way, the diaper 1B ensures the receiving capacity for feces higher than that in the diaper 1A shown in Fig. 1 and thereby reliably prevents any significant quantity of feces from leaking sideways beyond the end flaps 8 in the rear waist region 22. With this diaper 1B, it is not apprehended that any quantity of feces might cling to a wearer's skin in the front waist region 20 as well as in the rear waist region 22.

Fig. 9 is a partially cutaway perspective view showing still another embodiment 1C of the diaper and Fig. 10 is a cross-sectional view taken along ~~a line E~~ ~~—E~~ the line X - X in Fig. 9. In Fig. 9, a transverse direction is indicated by an arrow X and a longitudinal direction is indicated by an arrow Y. The diaper 1C shown in



- 17 -

Fig. 9 is distinguished from the diaper 1A shown in Fig. 1 in the arrangement as will be described below.

In this diaper 1C, the cores 4, 6 of the batt structure 4A, 6A are interposed between the top and backsheets 2, 3. The topsheet 2 is folded back along the distal end portion ~~[[6a2]]~~ 6d toward the side of the lower surface ~~[[6d]]~~ 6b of the batt structure 6A and tucked between the body ~~facing surface 4e~~ faceable surface 4a of the batt structure 4A and the lower surface ~~[[6d]]~~ 6b of the batt structure 6A.

~~In the diaper 1C, the~~ The body ~~facing surface 6e~~ faceable surface 6a of the batt structure 6A, a part of the lower surface ~~[[6d]]~~ 6b of the batt structure 6A ~~except the proximal end portion 6a1~~, and the body ~~facing surface 4e~~ faceable surface 4a of the batt structure 4A are defined with the topsheet 2.

~~In the diaper 1C, the~~ The first elastic member 10 under an extension in the transverse direction extends across the diaper 1C along a zone of the distal end portion ~~[[6a2]]~~ 6d of the batt structure 6A rather adjacent its proximal end portion 6c ~~[[6a1]]~~. The elastic member 10 lies between the first core 4 and the second core 6 and its transversely opposite end ~~regions~~ portions 10a are joined to the side edge ~~regions~~ portions ~~4b, 6b~~ 4d, 6e of the batt structures 4A, 6A by means of hot melt adhesive (not shown). The intermediate ~~region~~ portion extending between the transversely opposite end ~~regions~~ portions 10a is joined to the topsheet 2 by means of hot melt adhesive (not shown).

~~In the diaper 1C, the~~ The zone of the batt structure 4A underlying the distal

- 18 -

end portion ~~[[6a2]]~~ 6d of the batt structure 6A curves so as to delineate a circular arc which is convex downward with respect to the lower surface ~~[[6d]]~~ 6b of the batt structure 6A while the distal end portion ~~[[6a2]]~~ 6d of the batt structure 6A curves so as to delineate a circular arc which is convex upward with respect to the body ~~faeing~~  
5 ~~surface 4e~~ faceable surface 4a of the batt structure 4A. Between the batt structure 4A, 6A, the pocket P1 opening from the front waist region 20 toward the crotch region 21 is formed.

The topsheet 2 and the liquid-pervious sheet 5 may be formed of a hydrophilic fibrous nonwoven fabric or a finely porous plastic film. The backsheet 3 may be  
10 formed of a hydrophobic fibrous nonwoven fabric, a liquid-impervious plastic film, two-layers of hydrophobic fibrous nonwoven fabric laminated with each other or a composite sheet consisting of a hydrophobic fibrous nonwoven fabric and a plastic film bonded to this hydrophobic fibrous nonwoven fabric. The barrier cuffs 7 may be formed of a hydrophobic fibrous nonwoven fabric.

15 It is also possible to form the backsheet 3 and the leak~~[-proof]]~~ barrier cuffs 7 using a composite nonwoven fabric consisting of a highly water ~~[[restant]]~~ resistant fibrous nonwoven fabric made by melt blown process which is sandwiched by two layers of fibrous nonwoven fabric having a good strength and flexibility made by spun bond method.

20 Nonwoven fabric used herein may be selected from ~~[[a]]~~ the group including those obtained by spun lace-, needle punch-, melt blown-, thermal bond-, spun bond-,

- 19 -

chemical bond and air through processes. Component ~~fiber~~ fibers of such nonwoven fabric may be selected from ~~[[a]]~~ the group consisting of ~~[[polyolefine]]~~ polyolefin, polyester and polyamide-based fibers and core-sheath type or side-by-side type conjugated ~~fiber~~ fibers of polyethylene/polypropylene or polyethylene/polyester.

5            Bonding of the top and backsheets 2, 3, the liquid-pervious sheet 5 and the barrier cuffs 7 as well as attachment of the cores 4, 6, 18, and the elastic members 10, 11, 12, 13 to these top and backsheets 2, 3 and liquid-pervious sheet 5 may be carried out using hot melt adhesive or welding technique such as heat-sealing or ultrasonic sealing.

10           This invention is applicable not only to the diaper of open-type but also to a diaper of pants-type having its front and rear waist regions previously connected to each other.

            The disposable diaper according to this invention is primarily characterized in that contraction of the first elastic member causes the transversely opposite side edge  
15       regions of the supplementary absorbent batt structure to be pulled nearer to the longitudinal center line of the diaper, resulting in that the distal end portion of the batt structure curves so as to delineate a circular arc which is convex upward with the body facing surface of the basic absorbent batt structure. With this diaper, the pocket with a large opening from the front waist region toward the crotch region is formed  
20       between these batt structures. This pocket has a sufficiently large receiving capacity for feces to prevent any significant quantity of feces from leaking out onto the latter

- 20 -

batt structure and therefore there is no anxiety that any quantity of feces might cling to a wearer's skin.

With the diaper according to another embodiment, the transversely opposite side edge ~~regions~~ portions of the basic absorbent batt structure and the transversely opposite side edge ~~regions~~ portions of the supplementary absorbent batt structure are pulled nearer to the longitudinal center line as the first elastic member contracts. As a result, the zone of the basic absorbent batt structure underlying the distal end portion of the latter batt structure curved downward with respect to the lower surface of the latter batt structure while the distal end portion of the latter batt structure curves upward with respect to the body facing surface of the former batt structure. The pocket formed according to this alternative embodiment can offer an open space much larger than the pocket obtained by the embodiment in which only the ~~free-end region of the~~ latter batt structure curves upward with respect to the body facing surface of the former batt structure.

With the diaper arranged so that the supplementary absorbent batt structure has the absorbing capacity of bodily discharges higher than that of the basic absorbent batt structure, most of urine is absorbed and retained therein and to prevent any quantity of the urine once absorbed in the supplementary absorbent batt structure from migrating into the pocket and being mixed with feces within the pocket.

With the diaper having, in addition to the basic and supplementary absorbent batt structure and the second supplementary absorbent batt structure, contraction of

- 21 -

the second elastic member causes the transversely opposite side regions of the third core to be pulled nearer to the longitudinal center line so that the distal end portion of the second supplementary absorbent batt structure curves upward with respect to the body facing surface of the basic absorbent batt structure. In consequence, the pocket  
5 with a sufficient opening from the rear waist region toward the crotch region is formed between the basic and second supplementary absorbent batt structures to receive feces and thereby to prevent any quantity of feces from leaking out sideways beyond the end flaps in the rear waist region. With this diaper, there is no anxiety that any quantity of feces might cling to a wearer's skin in the front waist region as well as in the rear  
10 waist region.

The diaper according to still another embodiment having also, in addition to the basic and two supplementary absorbent batt structure, contraction of the second elastic member causes the transversely opposite side edge regions and the transversely opposite side edges of the second supplementary absorbent batt structure  
15 to be pulled nearer to the longitudinal center line of the diaper. In consequence, the zone of the basic absorbent batt structure underlying the distal end portion of the second supplementary absorbent batt structure curves downward with respect to the lower surface of the second supplementary absorbent batt ~~[[structure]]~~ structure while the distal end portion thereof curves upward with the body facing surface thereof.  
20 The pocket formed according to this alternative embodiment can offer an open space much larger than the pocket obtained by the embodiment in which only the distal end

- 22 -

portion of the second supplementary absorbent batt structure curves upward with respect to the body facing surface of the basic absorbent batt structure.